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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/646,307      | 08/22/2003  | Katherina Babich     | YOR920030129US1     | 9204             |

7590 10/18/2005  
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| EXAMINER |
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LEE, SIN J

|          |              |
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| ART UNIT | PAPER NUMBER |
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1752

DATE MAILED: 10/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/646,307

Applicant(s)

BABICH ET AL.

Examiner

Sin J. Lee

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on 29 July 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-34 is/are pending in the application.
- 4a) Of the above claim(s) 24-34 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-23 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☒ Claim(s) 1-34 are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_.

### **DETAILED ACTION**

1. Applicant's election with traverse of Group I (claims 1-23) in the reply filed on July 29, 2005 is acknowledged. The traversal is on the ground(s) that complete search for each Group would require a search of most, if not all, of the individual classes and subclasses and thus an examination of both Groups would not impose a serious burden on the Examiner. This is not found persuasive because as previously indicated, the search required for Group I (class 430, subclasses 270.1, 272.1, 286.1, 905, and 907) is not required for Group II (class 430, subclasses 311, 313, 323, 325, 326, 329, 330 and 942) and vice versa.

The requirement is still deemed proper and is therefore made FINAL. Claims 24-34 are withdrawn from further consideration as directed to non-elected invention.

### ***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1-23 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Applicants recite "a carbosilane polymer backbone comprising . . . at least one transparent moiety" in claims 1 and 23. It is unclear what wavelength range the moiety is supposed to be transparent to.

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 103***

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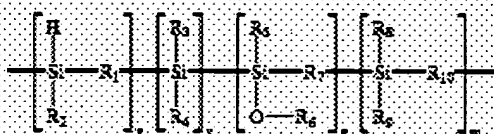
4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-3, 5-12, 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Apen et al (US 2003/0017635 A1).

Apen teaches (see ([0013]-[0022])) a thermally stable, low dielectric constant polyorganosilicon dielectric film for use as semiconductor insulators. The polyorganosilicon film is generated from specified polycarbosilane starting material by (i) applying to a suitable surface a composition comprising a *polycarbosilane* compound of the general formula shown below;

FORMULA I



[0015] in which:

[0016]  $R_1$ ,  $R_7$ , and  $R_{10}$  each independently represents a substituted or unsubstituted alkylene, cycloalkylene, or arylene group;

[0017]  $R_2$ ,  $R_3$ ,  $R_4$ ,  $R_5$ ,  $R_8$  and  $R_{11}$  each independently represents a hydrogen atom or a first organic group, wherein the first organic group comprises alkyl, alkenyl, alkynyl, alkylene, vinyl, cycloalkyl, allyl or aryl and may be linear or branched and may be substituted or unsubstituted; and

[0018]  $R_6$  represents an organosilicon, a silanyl, a siloxyl, or a second organic group; and

[0019]  $x$ ,  $y$ ,  $z$  and  $w$  satisfying the conditions of  $4 < x+y+z+w < 100,000$ , and  $y$  and  $z$  and  $w$  can collectively or independently be zero.

[0020] The first and second organic groups, or any other organic groups contemplated herein, may contain up to 18 carbon atoms but generally contain from about 1 to about 10 carbon atoms. Particularly useful alkyl groups include  $\text{---CH}_2\text{---}$  and  $\text{---(CH}_2\text{)}_e\text{---}$  where  $e > 1$ .

and (ii) subjecting the polycarbosilane-coated surface to an energy source to chemically react the polycarbosilane compound and to subsequently *crosslink* the polycarbosilane compound to form the polyorganosilicon material. Based on Apen's teaching, it would have been obvious to have  $R_1$ ,  $R_7$  and  $R_{10}$  in his Formula I to be alkylene groups ( $\text{---(CH}_2\text{)}_e\text{---}$  where  $e > 1$ ), have  $R_2$  to be an aryl group, and have  $R_8$  and  $R_9$  to be alkyl groups with a reasonable expectation of obtaining a low dielectric coating material that acts as an excellent electrical insulator in comparison with conventional materials and has good adhesion to underlying surfaces. Therefore, Apen teaching renders obvious present carbosilane polymer backbone comprising at least one chromophore moiety and at least

one transparent moiety (H and alkyl groups). Also, since Apen states that his polycarbosilane compound is *crosslinked* subsequently by chemically reacting the polycarbosilane compound, it is the Examiner's position that Apen's teaching implies that his polycarbosilane compound contains a crosslinking component. Therefore, Apen's teaching renders obvious present inventions of claims 1-3, 5-12, 15 and 16 (it is the Examiner's position that Apen's coating comprising the polycarbosilane compound would inherently be capable of being used as the present antireflective hardmask layer for lithography). In [0047], Apen teaches that his polycarbosilane-coated surface may comprise a substrate, a dielectric material, or any other suitable material or layered material that can be used in an electronic or semiconductor application. Therefore, Apen's teaching also renders obvious present invention of claim 23.

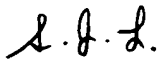
6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sin J. Lee whose telephone number is 571-272-1333. The examiner can normally be reached on Monday-Friday from 9:00 am EST to 5:30 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cynthia Kelly, can be reached on 571-272-1526. The fax phone number for the organization where this application or proceeding is assigned is **571-273-8300**.

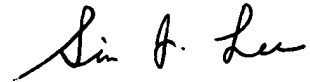
Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only.

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For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



S. Lee  
October 13, 2005



**SIN LEE**  
**PRIMARY EXAMINER**